



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,367	12/12/2001	Kevin K. Lehmann	PRU-101US	8107
23122	7590	02/04/2005	EXAMINER	
RATNERPRESTIA			PHAM, HOA Q	
P O BOX 980			ART UNIT	PAPER NUMBER
VALLEY FORGE, PA 19482-0980			2877	

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/017,367

Applicant(s)

LEHMANN ET AL.

Examiner

Hoa Q. Pham

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Declaration under 37 CFR 1.132 filed 11/18/04 is sufficient to overcome the rejection of claims 1-56 based upon the combination of the references of Stewart et al and Fischer et al.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8, 11-12, 14/11, 14/12, 17-49 and 52-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hensel et al (DE-19814575A1) in view of Stewart et al (Intra-Cavity and Ring-down Cavity absorption with Fibre Amplifier for Trace Gas Detection).

Regarding claims 1, 6, 14/11, 14/12, 18, 28, 48-49, 53-54, 56, Hensel et al (of record) discloses a passive fiber optic sensor for determining the physical and chemical parameter relating to a sample comprises a fiber optic ring (10) having a plurality of optodes (12, 13, 14) thereof exposed to the sample gas or liquid, a coherent source (2) of radiation, a receiver (4) coupled to the optical ring (10) for receiving a portion of the radiation resonant in the passive fiber optic ring and a processor (inherent) coupled to the detector for determining the level of the trace species in the gas sample or liquid

Art Unit: 2877

sample based on the signal generated by the detector (figure 1). Hensel et al does not explicitly teach the use of coupling means includes a first coupler for introducing a portion of the radiation emitted by the light source to a first section of the fiber optic ring and a second coupler for receiving a portion of the radiation in the fiber optic ring at a second section thereof; however, such a feature is known in the art as taught by Stewart et al. Stewart et al, from the same field of endeavor, teaches the use of a plurality of couplers for coupling the light source to the optical fiber and the detector to the optical fiber (figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to include in Hensel et al a plurality of couplers for introducing a portion of radiation to the fiber and receiving a portion of radiation from the fiber to the detector because this is a known couplers which is known to split or transfer light to an optical fiber.

Regarding claim 2, it would have been obvious to use the basic device of Hensel et al to determine the level of the trace species based on a rate of decay of the signal generated by the detector as suggested by Stewart (see page 448, third paragraph of Stewart).

Regarding claims 3 and 52, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a single optical coupler instead of two couplers, thus reduce the cost of the device.

Regarding claims 4-5, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in Hensel et al a filter placed in an optical path between the optical fiber and the detector to selectively pass the received

portion of radiation from the passive fiber optic loop to the detector if a certain wavelength is selected.

Regarding claims 7-8, 17 and 55, see figures 4 and 5 of Hensel et al for the exposed portion (22, 24, 25) of the fiber (10).

Regarding claims 11-12 and 29-30, Stewart teaches that light source is a pulsed laser source (page 448, third paragraph "FIBRE CAVITY RING-DOWN SYSTEM") in the infrared region (page 448, second paragraph and page 449, line 2), it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the light source of Hensel et al by a pulsed laser source as taught by Stewart because the device would function in the same manner.

Regarding claims 19 and 20, Hensel et al teaches the use of a passive resonant fiber loop (10). Thus it would have been obvious to one having ordinary skill in the art to use an optical fiber of fused silica, sapphire and fluoride based glass or from a hollow fiber because this is a known material that used for forming optical fiber.

Regarding claims 21 and 22, Hensel et al teaches the use of single mode (figure 1) and Stewart teaches the use of the passive resonant fiber is single mode fibers and multi-mode fibers (see figure 1 of Stewart et al).

Regarding claim 31, Hensel et al teaches that at least a portion of the passive fiber optic ring is disposed within the liquid sample for determining a presence of the trace species in the liquid sample (figures 4-5).

Regarding claims 39 and 40, it is inherent that the test medium will have refractive index different from the refractive index of the fiber core. Thus, it would have

been obvious to one having ordinary skill in the art at the time the invention was made to choose an index of refraction of the fiber is greater than an index of refraction of the sample liquid.

Regarding claims 41-44, since the radiation loss in the optical fiber is significant problem, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in Hensel et al means for controlling the radiation portion that enter the fiber optic ring.

Regarding claims 45-47, Hensel et al teaches that the optical fiber sensor is used in fire alarms or for room air quality; thus, due to the length of the space to be tested, it would have been obvious to choose the length of the fiber optic ring at least about 15-20 meter long.

4. Claims 9-10, 13, 14/13, 15, 16 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hensel et al and Stewart et al as applied to claims 1-8 above, and further in view of Lehmann (5,528,040) (of record).

Regarding claims 9-10, Hensel et al and Stewart et al do not explicitly teach that the coherent source of radiation is an optical parametric generator; however, such a feature is known in the art as taught by Lehmann. Lehmann, from the same field of endeavor, teaches the use of an optical parametric generator (figure 1) for trace species detection. It would have been obvious to one of ordinary skill in the art to replace the light source of Hensel et al by an optical parametric generator taught by Lehmann

Art Unit: 2877

because they are function in the same manner. A substitution one for another is generally recognized as being within the level of ordinary skill in the art.

Regarding claims 13,15, and 16, Lehmann teaches the use of a continuous wave laser (20) (figure 1).

Regarding claim 14/13, Hensel et al teaches that the system is a fiber optic system (see figure 1).

Regarding claims 50-51, Lehmann teaches the use of a second optical detector (PD 2), which generates a trigger signal to the processor responsive to receiving radiation from the coherent source.

Response to Arguments

5. Applicant's arguments with respect to claims 1-56 have been considered but are moot in view of the new ground(s) of rejection.

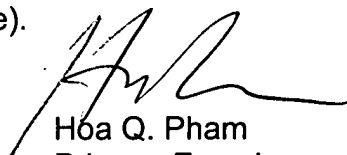
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lerber et al (US 2002/0092977 A1) discloses a method for measuring at least one physical parameter using an optical resonator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoa Q. Pham whose telephone number is (571) 272-2426. The examiner can normally be reached on 7:30AM to 6 PM, Monday through Thursday.

Art Unit: 2877

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hoa Q. Pham
Primary Examiner
Art Unit 2877

HP
February 2, 2005